Before the
Federal Communications Commission
Washington, D.C. 20554

FCC 96-93

In the Matter Of	)	
	)	
Federal-State Joint Board on	)	CC Docket No. 96-45
Universal Service	)	
	)	

Ex Parte Presentation of the
Rural Utilities Service

The Rural Utilities Service (RUS) hereby reports *ex parte* representations to members of the Federal Communications Commission (Commission) staff on January 27, 1998, at Commission offices at 2100 M Street. The meeting was on the subject of voice grade access (CC Docket No. 96-45), and was attended by the following:

Attendee	Representing
Lisa Boehley	Federal Communications Commission
Bob Loube	Federal Communications Commission
Diane Law	Federal Communications Commission
Abdel Eqab	Federal Communications Commission
Bill Howden	Federal Communications Commission
Whitey Thayer	Federal Communications Commission
Sonja Rifken	Federal Communications Commission
Stagg Newman	Federal Communications Commission
Fred Lee	National Telecommunications Information Agency
Christopher A. McLean	Rural Utilities Service
Elizabeth Jones	Rural Utilities Service
Ed Cameron	Rural Utilities Service

Introduction

The RUS (formerly the Rural Electrification Administration) is a rural development agency of the U.S. Department of Agriculture that has promoted universal service in rural America for 48 years through targeted lending, technical support and policy guidelines. RUS telecommunications borrowers provide service to 40 percent of the landmass of the country, which is roughly half of the rural portions of the continental United States. Comprising 80 percent of the landmass, but only 20 percent of the population, rural America needs modern telecommunications to bring high quality education, health care, and commerce to rural families and businesses. Telecommunications frees the rural population from limitations of time and space.

RUS is in a unique position to comment on rural America's telecommunications needs. The Agency's goal has always been to provide every rural household with affordable service. Our point of reference is the urban and suburban subscriber. We have sought to ensure that RUS borrowers provide telecommunications service that works like, sounds like, and costs like the urban and suburban customers' service. Since this is much harder to do in low density areas, RUS has created its own practices and standards which addressed the rural challenges. RUS stretches available funding resources by examining costs and system designs. RUS-financed systems are designed to be expandable and upgradable to meet rural America's needs economically throughout the anticipated economic life of the plant installed.

As with the RUS' previous filings on this docket, this presentation addresses all of rural America, not just those portions served by RUS borrowers. Although RUS has an outstanding portfolio of approximately $5.2 billion in loans outstanding or guaranteed, and RUS does have a concern about loan security, the overriding issue is the health, education, and economic condition of all of rural America. And as in the past, we are technology neutral and favor any technology that will economically establish and maintain universal service, be it wireline, wireless, or satellite.

The purpose of this presentation is to summarize what was said in the January 27, 1998, meeting.

The January 27, 1998 Meeting

- **The Commission set the definition of voice grade access for universal service support through an open and exhaustive rulemaking process. In its reconsideration, adopted December 30, 1997, the Commission significantly reduced the bandwidth component of that definition on its own motion.**

The RUS pointed out that as part of the Telecommunications Act of 1996 (Act), a Federal State Joint Board (Joint Board) was established to provide guidance to the Commission as

it prepared regulations to implement the Act's Universal Service Provisions (Section 254). The Joint Board recommended that voice grade service be defined as having a frequency range (bandwidth) of 500 to 4000 hertz. This definition was recommended after extensive public input was obtained in hearings and written comments, including comments filed by the RUS. The Commission adopted the Joint Board's recommendation concerning voice grade bandwidth in its *Universal Service Report and Order* dated May 8, 1997 (May 8 Order), after having received further comment including extensive comment on the Joint Board's recommendations.

In the Fourth Order on Reconsideration, issued December 30, 1997 (Fourth Order), the Commission significantly changed the definition of voice grade bandwidth without seeking comment. The new definition of voice grade access is 300 to 3000 Hz.

- **This reduction will be felt almost exclusively in rural America.**

Short urban and suburban loops inherently have a wide voice bandwidth. Most urban and suburban loops do not require loop treatment which restricts bandwidth. Most rural loops do have loop treatment. (Loops over 18,000 feet require treatment.)

Each circuit element in a local loop can limit bandwidth, and those effects will compound if the limits are close together. Loops comprise central office switches, physical wires (usually copper) which connect customers to those switches, and other electronic systems which are used to minimize or replace copper wires. All loops use a switch, so all are subject to the bandwidth limitations of the switch. Currently, digital switches limit the top frequency of a loop to somewhere between 3400 and 3500 Hz. This limit is a design decision made by the switch manufacturer, and it could change - the theoretical top frequency of devices using the current standard sampling rate is 4000 Hz. Most other electronic systems are based on the same sampling technology, so they offer the same upper frequency limits as digital switches.

The equality between urban and rural loops ends there. Rural loops are bandwidth limited by their copper wires. High frequency performance of copper loops declines as the loops get longer. Urban and suburban loops have short wires (most are under 18,000 feet) which will pass fairly high frequencies. For example, a 6,000 foot copper wire pair will support T1 carrier, the spectral density of which is centered at 750 kilohertz. Urban loops rarely limit voice bandwidth. Longer loops which serve rural subscribers (most are well over 18,000 feet) require loading with inductors which limits higher frequencies and also introduces phase shift across the voice band. Rural loops can be economically designed to pass frequencies higher than the current digital switch cutoff, or they can be designed to provide lower cutoffs such as the 3000 Hz specified by the Commission in the Fourth Order.

The economic life of a digital switch is estimated by RUS to be under 12 years, and the economic life of copper cable is over 20 years. The reduction in required bandwidth,

which will affect primarily rural copper plant, could be a permanent barrier between rural subscribers and the important (and economically available) frequencies above 3000 Hz.

- **The effect of this reduction will be to slow down rural America's access to information technology.**

The higher frequencies in the voice band are critical to any users' access to information services via computer modems. Modern popularly-priced home computers are equipped with modems with a capability of data transmission at a rate of 28.8 kilobits per second (Kbps). Modems test the telecommunications circuit they are operating over and select a data transmission scheme and rate for maximum speed without error. They test for the top frequency the circuit will transmit, and they test other performance factors. A circuit that is limited to only 3000 Hz will cause the modem to operate at a significantly lower speed than one that will pass higher frequencies, if other factors test about the same.

A 3400 Hz circuit will not guarantee that a modem will connect at 28.8 Kbps, but 3000 Hz circuit will practically guarantee that a it will not. A wider voice band makes a modem more tolerant of other circuit performance flaws that are more common on rural loops, such as phase shift. Restricted bandwidth is not the only impediment to modem performance, but it is the most permanent.

The Commission staff stated that it realized, after issuing the May 8 Order, that few telecommunications circuits in the nation could pass 4000 Hz. The RUS agreed with this, but argued that the Commission has gone too far in reducing the top end of the voice band to 3000 Hz.

- **A higher bandwidth would be more consistent with the Universal Service Principles in Section 254(b)(3) and 254(c)(1) of the Act.**

The RUS believes that the Act is intended to provide rural Americans with access to telecommunications and information services comparable to the access that urban and suburban customers enjoy. The reduced bandwidth requirement for voice grade access, which is now at a level below that which is available to urban and suburban customers, will hurt rural customers.

- **Carriers who have some loops that can't meet a higher bandpass requirement can be accommodated.**

A requirement for voice grade access higher than 3000 Hz would not have to deny universal service support to carriers who cannot yet meet it because the requirement could be phased in.

The Commission defined universal service as one-party service despite the fact that there

decision. The May 8 Order requires one-party service but provides for a phase-in to prevent carriers from losing support until they can reasonably eliminate lower grades of service.

Rural bandwidth comparable to urban bandwidth could be phased in the same way.

Until the Fourth Order, it was clear that the objective of the Commission in defining the supported services was not to find the lowest common denominator of services offered around the Nation. Universal service should be defined in a manner that is fully consistent with the Act.

- **The new bandwidth is based on a definition of voice grade access that is obsolete and possibly irrelevant to this proceeding.**

In the Fourth Order, the Commission states it chose to reduce bandwidth for voice grade access because that is the way voice grade access is defined by the American National Standards Institute (ANSI). This not a new ANSI definition. It was in effect when the Commission issued the May 8 Order, it was in effect while the Joint Board deliberated, and RUS believes it has been in effect for over 40 years. The RUS has documents from the 1950's that state the same 300 to 3000 Hz bandwidth for telephone service. These documents were based on the national standards of the day. Of the several bandwidths to which the Commission makes reference in the Fourth Order, the Commission chose the oldest and most restrictive.

The core service definition of voice grade access for universal service support purposes should not be written by a national standards setting organization. Congress provided the guidelines for defining the supported services in Section 254(c) of the Act. Standards setting organizations do not necessarily have to follow such guidelines - they are more likely to search for consensus among service providers and therefore may engage in a lowest common denominator search. Public policy decisions such as the definition of supportable services should be made only after the public has an opportunity to be heard. Standards setters do not conduct standards setting in a manner that encourages comment from the general public. For example, parties with an interest in this issue, such as rural educators and rural small businesses, do not have access to the national standards setting process.

Conclusion

The reduction in the definition of voice grade bandwidth will not provide comparable service in rural areas as required by the Universal Service Principles, will be felt almost exclusively in rural America, and will hamper rural customers as they try to use the Internet and other information services. The few hundred Hertz above 3000 are crucial to rural Americans and to fulfilling the Act's goal that rural service be comparable to that in urban areas. Without these few Hertz, rural schoolchildren will be waiting for information to be delivered to their computers while their urban cousins have moved on to the next question.

The RUS recommends that the Commission reconsider this reduction in the quality of voice grade bandwidth.

CHRISTOPHER A. McLEAN
Deputy Administrator
Rural Utilities Service

JAN 30 1998

cc: All attendees